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EXAMINER	
TAKAOKA, DEAN O	

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/623,382	CARSON, JAMES CRAWFORD	
	Examiner	Art Unit	
	Dean O Takaoka	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,14-17,21-29 and 31-37* is/are rejected.

7)☒ Claim(s) *11-13,18-20 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/31/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed October 31, 2003 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because reference CF (Accatino) does not include a date. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "analog amplifier" (claim 9) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 7, 9, 11, 17, 23, 33 and 37 are objected to because of the following informalities:

Claims 7, 9, 17, and 33: (Markush grouping)

The claims are drawn to a Markush grouping where the word "essentially" is recited preceding the Markush grouping. Additionally, claims 7, 17 and 33, do not include the word "and" between the final group and the next to final group. This is an improper Markush grouping, see MPEP § 2173.05(h).

Claims 11 and 37: (preamble)

Claim 11 recites "The beam forming network of claim 1" in the preamble where no beam forming network is recited in claim 1. For consistency, the Examiner requests the preamble of dependent claim 11 to recite the same preamble such as in claim 1.

Claim 37 recites "The stripline signal processing network of claim 36" in the preamble where "A **modular** stripline signal processing network" is recited in claims 35

and 36. For consistency, the Examiner requests the preamble of dependent claim 37 to recite the same preamble such as in claims 35 and 36.

Claim 23 recites the word "stripline" twice in the first line of the claim and believes this is a typographical error.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 5, 10, 14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishikawa et al. (US Patent No. 5,634,208).

Claim 1:

Nishikawa et al. (best shown in Fig. 4A) shows a stripline signal processing module (where the transmission lines are microstrips, e.g. striplines, and in the same or nearly identical configuration as shown by the Applicant in Figs. 3A and 3B comprising a middle ground plane, thus the transmission lines of Nishikawa et al. also being striplines) comprising: a first planar dielectric substrate defining an edge (1); a second planar dielectric substrate defining an edge (5); a ground plane (4); the first dielectric substrate, the second dielectric substrate, and the ground plane adhered together in an overlaying configuration with the ground plane located between the first and second dielectric substrates and the edges aligned to form an interface edge (Fig. 4A); a first

stripline circuit (21) carried on the first dielectric substrate; a second stripline circuit (61) carried on the second dielectric substrate; one or more input ports located at the interface edge and electrically connected to the first or second stripline circuits (71-73); one or more output ports located at the interface edge and electrically connected to the first or second stripline circuits; and the first and second stripline circuits configured to receive propagating signals at the input ports (71), perform a signal processing operation on the received propagating signals, and deliver processed signals to the output ports (72, 73).

Claim 2:

The first dielectric substrate (1), the second dielectric substrate (5), and the ground plane (4) are approximately coextensive in their planar dimensions (where the term "approximately" is an open term with the limits not defined by the claim; where ground 4 extends substantially along the width of the substrate, albeit split in the center, and extends substantially along the length of striplines 61 and 71, thus "approximately" coextensive); and the first and second stripline circuits comprise stripline exposed to the dielectric on one side and exposed to air or a dielectric on an opposing side (where stripline 21 is exposed to dielectric substrates 1, 3 on both sides and stripline 61 is exposed to dielectric substrate 5 on one side and air on the other side).

Claim 3:

Further comprising one or more electrical connections between the first and second stripline circuits (vias 91, 92).

Claim 4:

Where the electrical connections between the first and second stripline circuits comprise tap-through connectors (vias 91, 92) passing through and insulated from the ground plane (where the visa are not connected to ground and inherently insulated by the dielectric substrate).

Claim 5:

Where the first and second striplines are non-crossing (where striplines 61 and 71 are overlaid in a parallel configuration and do not cross each other; further illustrated by Fig. 5 in a well-known Wilkinson divider).

Claim 14:

Nishikawa et al. (best shown in Fig. 4A and Figs. 20 – 25) shows a stripline signal processing module (where the transmission lines are microstrips, e.g. striplines, and in the same or nearly identical configuration as shown by the Applicant in Figs. 3A and 3B comprising a middle ground plane, thus the transmission lines of Nishikawa et al. also being striplines) comprising: a first planar dielectric substrate defining an edge (1); a second planar dielectric substrate (5) that is approximately coextensive with the first planar dielectric substrate defining an edge; a ground plane (4) that is approximately coextensive with the first planar dielectric substrates (where the term "approximately" is an open term with the limits not defined by the claim; where ground 4 extends substantially along the width of the substrate, albeit split in the center, and extends substantially along the length of striplines 61 and 71, thus "approximately" coextensive); the first dielectric substrate, the second dielectric substrate, and the ground plane adhered together in an overlying configuration with the ground plane

located between the first and second dielectric substrates and the edges aligned to form a interface edge (shown in Fig. 4A); a first stripline circuit (21) exposed to the first dielectric substrate (1) on one side and exposed to a dielectric material on an opposing side (3); a second stripline circuit (61) exposed to the second dielectric substrate (5) on one side and exposed to air on an opposing side (above 61 – Fig. 4A); a plurality of input interface ports located at the interface edge and electrically connected to the first stripline circuit (where with respect to Figs. 20 and 23, inputs 71 and 73 are connected to 21); a plurality of output interface ports located at the interface edge and electrically connected to the first stripline circuit (where with respect to Figs. 20 and 23, outputs 72 and 74 are connected to 61);one or more tap-through connectors (vias 91, 92) passing through and insulated from the ground plane (where the visa are not connected to ground and inherently insulated by the dielectric substrate); and the first and second stripline circuits configured to receive propagating signals at the input ports (71, 73), perform a signal processing operation on the received propagating signals, and deliver processed signals to the output ports (72, 73; where Figs 20 – 24 change the phase by 90° and shown in Fig. 25 – col. 11, line 66 and col. 12, lines 60-67).

Claims 10 and 16:

Where the first or the second stripline circuits comprises one or more sinuous trace legs (sinuous defined by Merriam-Webster's Collegiate Dictionary (10^{th} edition) as serpentine) configured to exhibit a desired phase and impedance characteristic while reducing the displacement of the trace in a selected dimension (where Fig. 23 shows a meander or snaked stripline, defined by the Examiner as serpentine, thus sinuous;

where Nishikawa et al. further teaches the coupler being a 90° hybrid and having a characteristic impedance of 70 ohms, thus exhibiting a desired phase and impedance characteristics. The snaked or sinuous shape further reduces or is less than a straight line length, thus inherently reducing the displacement of the trace in a selected dimension, e.g. in a planar dimension).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 4, 6 – 9, 14, 15, 17 and 21 – 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosen (US Patent No. 4,879,711) in view of Nishikawa et al.

Claims 1, 3, 4, 14, 21 and 23:

Rosen (best shown in Fig. 10) shows a satellite communication system comprising a signal processing module and network (Fig. 10) further comprising well-known generic hybrid couplers (128-134; col. 11, line 56) where the hybrid coupler splits signals defining a first and second stage orthogonal beam forming networks (such as hybrid coupler 120 splitting signals to transmission lines 136 and 138) where the coupler participates in the formation of a crossover (where the hybrid coupler splits signals into crossover sub-group channels, e.g. 1-16, thus participating in the formation of crossovers) (claim 21); but does not show the well-known specific stripline coupler.

Nishikawa et al. shows a well-known art-recognized equivalent specific hybrid coupler comprising first and second planar dielectric substrates with first and second striplines disposed on each substrate respectively and a ground plane (discussed in the reasons for rejection under 35 U.S.C. 102 (b) anticipated by Nishikawa et al. of the claims above); comprising one or more electrical connections between the first and second stripline circuits; comprising one or more tap-through connectors or vias (discussed in the reasons for rejection of claims 3 and 4 above); and where the first and second stripline circuits receive propagating signals at the input ports, perform a signal processing operation on the received propagating signals, and deliver processed signals to the output ports (discussed in the reasons for rejection of claim 14 above).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the generic coupler disclosed by Rosen with the well-known art-recognized equivalent specific stripline coupler disclosed by Nishikawa et al. Such a modification would have been a mere substitution of well-known art-recognized equivalent specific stripline couplers where Nishikawa et al. further provides the advantageous benefit of implementing a high impedance, low loss transmission lines providing a miniature high performance hybrid (Nishikawa et al. – abstract and col. 1, lines 31-36) thus suggesting the obviousness of the substitution.

Claim 6:

Rosen and Nishikawa et al. teach the stripline signal processing module, discussed in the reasons for rejection of claims 1 and 4 above, where Rosen further teaches the module comprising an orthogonal beam forming network (col. 2, lines 67,

68; where the hybrid coupler splits signals into crossover filters for channels 1-16 – Fig. 10, thus participating in the formation of crossovers).

Claim 7:

Rosen and Nishikawa et al. teach the stripline signal processing module, discussed in the reasons for rejection of claims 1, 4 and 6 above, where Rosen further teaches the module comprising a diplexer filter (259) comprising at least three ports (Fig. 24).

Claim 8:

Rosen and Nishikawa et al. teach the stripline signal processing module, discussed in the reasons for rejection of claims 1 and 3 above, where Rosen further teaches the circuits participate in the implementation of one or more crossovers associated with the hybrid junction circuit, discussed in the reasons for rejection of claim 6 above.

Claim 9:

Rosen and Nishikawa et al. teach the stripline signal processing module, discussed in the reasons for rejection of claim 1 above, where Rosen further teaches the first and second stripline circuits define a network selected from a group consisting of a beam forming network and an analog amplifier (251 and/or 263 – Fig. 24).

Claim 15:

Rosen and Nishikawa et al. teach the stripline signal processing module, discussed in the reasons for rejection of claim 14 above, where Rosen further teaches the circuits participate in the formation of crossovers connecting the first and second

stage orthogonal beam forming network into a multi-stage orthogonal beam forming network (where hybrid coupler receives a signal, e.g. R4, and splits the signal into multiple branches 116 and 118 – Fig. 10).

Claim 17:

Rosen and Nishikawa et al. teach the stripline signal processing module, discussed in the reasons for rejection of claim 15 above, where Rosen further teaches the module comprising a diplexer filter (259) comprising at least three ports (Fig. 24).

Claim 22:

Rosen and Nishikawa et al. teach the stripline signal processing module, discussed in the reasons for rejection of claim 21 above, where Nishikawa et al. further teaches the stripline circuit comprising stripline segments having sizes selected to exhibit desired phase and impedance characteristics (where Nishikawa et al. teaches among other embodiments, 1/12 and 1/8 wavelength transmission lines with a defined characteristic impedance of 70 ohms, and achieving a 90° phase shift – col. 11, line 66 to col. 12, line 68); and the electrical connectors between the first and second stripline circuits comprise tap-through connectors passing through and insulated from the ground plane (where the visa are not connected to ground and inherently insulated by the dielectric substrate, discussed in the reasons for rejection of claim 4 above).

Claim 24:

Rosen and Nishikawa et al. teach the stripline signal processing module, discussed in the reasons for rejection of claim 23 above, where Nishikawa et al. further teaches the stripline circuit, the first and second portions of the network (e.g. striplines

of claim 23) are non-crossing (where Nishikawa et al. shows striplines 61 and 71 are overlaid in a parallel configuration and do not cross each other; further illustrated by Fig. 5, 20 and 23); and the electrical connections between the first and second portions of the network participate in the formation of a crossover associated with the network (where Rosen shows the circuits participate in the implementation of one or more crossovers associated with the hybrid junction circuit, discussed in the reasons for rejection of claim 6 above).

Claims 25 and 31 – 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munoz-Garcia et al. (US Patent No. 6,340,948) or Acoraci (US Patent No. 4,356,461) in view of Nishikawa et al.

Claims 25 and 35:

Munoz-Garcia et al. or Acoraci show a modular signal processing network comprising a interconnected set of network modules (Figs. 4 and 5 by Munoz-Garcia et al. or Figs. 1 and 11 by Acoraci) and further comprising well-known generic hybrid couplers (52 by Munoz-Garcia et al. or 30-41 by Acoraci); but do not show the well-known specific stripline coupler.

Nishikawa et al. shows a well-known art-recognized equivalent specific hybrid coupler comprising first and second planar dielectric substrates with first and second striplines disposed on each substrate respectively and a ground plane; comprising one or more input and output ports located along the interface edge defined by the dielectric substrate board to receive propagating signals at the input port, perform a signal

processing operation on the received propagating signals, and deliver processed signals to the output ports (discussed in the reasons for rejection under 35 U.S.C. 102 (b) by Nishikawa et al. of the claims above).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the generic coupler disclosed by Munoz-Garcia et al. or Acoraci with the well-known art-recognized equivalent specific stripline coupler disclosed by Nishikawa et al. Such a modification would have been a mere substitution of well-known art-recognized equivalent specific stripline couplers where Nishikawa et al. further provides the advantageous benefit of implementing a high impedance, low loss transmission lines providing a miniature high performance hybrid (Nishikawa et al. – abstract and col. 1, lines 31-36) thus suggesting the obviousness of the substitution.

Claim 31:

Munoz-Garcia et al. or Acoraci and Nishikawa et al. teach the modular stripline signal processing network module, discussed in the reasons for rejection of claim 25 above, where Nishikawa et al. further teaches the electrical connections between the first and second stripline circuits comprise tap-through connectors (vias 91, 92) passing through and insulated from the ground plane (where the visa are not connected to ground and inherently insulated by the dielectric substrate, discussed in the reasons for rejection of claim 4 above).

Claim 32:

Munoz-Garcia et al. or Acoraci and Nishikawa et al. teach the modular stripline signal processing network module, discussed in the reasons for rejection of claim 25

above, where the first and second hybrid circuits are non-crossing (Fig. 4 by Munoz-Garcia et al. or Fig. 1 of Acoraci); and the electrical connections between the first and second stripline circuits participate in the formation of a crossover associated with the signal processing network (where Munoz-Garcia et al. or Acoraci both show crossovers at the output of the hybrid circuit).

Claim 33:

Munoz-Garcia et al. or Acoraci and Nishikawa et al. teach the modular stripline signal processing network module, discussed in the reasons for rejection of claim 25 above, where Munoz-Garcia et al. or Acoraci teach the beam forming Butler matrix.

Claim 34:

Munoz-Garcia et al. or Acoraci and Nishikawa et al. teach the modular stripline signal processing network module, discussed in the reasons for rejection of claim 25 above, where Nishikawa et al. teaches the first or the second stripline circuits comprises one or more sinuous trace legs (sinuous defined by Merriam-Webster's Collegiate Dictionary (10^{th} edition) as serpentine) configured to exhibit a desired phase and impedance characteristic while reducing the displacement of the trace in a selected dimension (where Fig. 23 shows a meander or snaked stripline, defined by the Examiner as serpentine; where Nishikawa et al. further teaches the coupler being a 90° hybrid and having a characteristic impedance of 70 ohms, thus exhibiting a desired phase and impedance characteristics. The snaked or sinuous shape further reduces or is less than a straight line length, thus inherently reducing the displacement of the trace in a selected dimension, e.g. in a planar dimension).

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Munoz-Garcia et al. or Acoraci and Nishikawa et al., as applied to claim 25 above and further in view of Koch (US Patent No. 5,032,803).

Munoz-Garcia et al. or Acoraci and Nishikawa et al. teach the modular stripline signal processing network module, discussed in the reasons for rejection of claim 25 above, where Munoz-Garcia et al. and Acoraci show a generic orientated modules (Figs. 4 and 5 by Munoz-Garcia et al. or Figs. 1 and 11 by Acoraci) and where Nishikawa et al. shows a planar oriented hybrid stripline coupler but are silent with respect to specific connections between coupler modules and the circuit board such as being edge connected to another network board through soldered connections.

Koch (Fig. 4) shows a similar multi-layer stripline coupler comprising a specific well-known art-recognized equivalent vertically orientated coupler module which is edge connected to another board and soldered (41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the generic stripline coupler module connection disclosed by Munoz-Garcia et al. or Acoraci and Nishikawa et al. with the specific well-known art-recognized equivalent edge connected stripline coupler module connection disclosed by Koch. Such a substitution would have been a mere implementation of a specific well-known art-recognized equivalent connections of couplers to a circuit board; further where Koch teaches the coupler being able to be connected to a mother-board

with relatively little space (col. 2, lines 10-14) thus suggesting the obviousness of the modification.

Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munoz-Garcia et al. or Acoraci, Nishikawa et al., and Koch, as applied to claim 25 above and further in view of Andry et al. (US Patent No. 6,392,160).

Munoz-Garcia et al. or Acoraci, Nishikawa et al., and Koch teach the edge connected modular stripline signal processing network module, discussed in the reasons for rejection of claim 25 above, but are silent with respect to the connection between the coupler module and the circuit board being a removable (claim 27); or separable comprising blind-mate coaxial connectors (claim 28).

Andry et al. (Fig. 1) shows a well-known plug-in module of a network comprising a specific well-known art-recognized equivalent vertically orientated modules which are edge connected and removable (shown in Fig. 1); or separable comprising blind-mate coaxial connectors (Figs. 2A – 3B; col. 4, lines 50-52).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the soldered stripline coupler module connection disclosed by Munoz-Garcia et al. or Acoraci, Nishikawa et al. and Koch with the removable stripline coupler module connection disclosed by Andry et al. Such a substitution would have been a mere implementation of a specific well-known art-recognized equivalent connections of couplers to a circuit board, e.g. making separable; further where the removable connection of Andry et al. would inherently facilitate ease

for replacement or installation of the module from the circuit board thus suggesting the obviousness of the modification.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Munoz-Garcia et al. or Acoraci, Nishikawa et al., Koch, and Andry et al. as applied to claim 27 above and further in view of Roederer (US Patent No. 5,115,248).

Munoz-Garcia et al. or Acoraci, Nishikawa et al., Koch and Andry et al. teach the edge connected modular stripline signal processing network module, discussed in the reasons for rejection of claim 25 above, where Nishikawa et al. teaches the specific stripline module and where Acoraci further teaches the network modules in the N x N Butler matrix comprising M x M and P x P Butler matrices where M can be equal to or differ from P but do not explicitly show where the network modules implement a lower order hybrid junction and combine network modules to implement a higher-order junction circuit.

Roederer (Fig. 24B and 24C) shows a similar network module comprising hybrid dividers where the network modules implement a lower order hybrid junction and combine network modules to implement a higher-order junction circuit (9 x 16 matrix connected to 16 x 16 matrix).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the symmetrical network module matrix disclosed by Munoz-Garcia et al. or Acoraci, Nishikawa et al., Koch and Andry et al. with the lower order hybrid junction connected to a higher order junction disclosed by Roederer. Such

a modification would have realized the advantageous benefit of using a lower number of couplers where the total length of lossy lines is approximately four wavelengths, the amplifiers having no ripple with the beam using all uniformly loaded amplifiers and one feed from each group (Roderer: col. 9, lines 52-58); further where Acoraci (abstract) teaches the network modules in the N x N Butler matrix comprising M x M and P x P Butler matrices where M can be equal to or differ from P
thus suggesting the obviousness of the modification.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Munoz-Garcia et al. or Acoraci and Nishikawa et al., as applied to claim 35 above and further in view of Roederer (US Patent No. 5,115,248).

Munoz-Garcia et al. or Acoraci and Nishikawa et al. teach the modular stripline signal processing network module, discussed in the reasons for rejection of claim 35 above, where Nishikawa et al. teaches the specific stripline module and where Acoraci further teaches the network modules in the N x N Butler matrix comprising M x M and P x P Butler matrices where M can be equal to or differ from P but do not explicitly show where the network modules implement a lower order hybrid junction and combine network modules to implement a higher-order junction circuit.

Roederer (Fig. 24B and 24C) shows a similar network module comprising hybrid dividers where the network modules implement a lower order hybrid junction and combine network modules to implement a higher-order junction circuit (9 x 16 matrix connected to 16 x 16 matrix).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the symmetrical network module matrix disclosed by Munoz-Garcia et al. or Acoraci, Nishikawa et al., Koch and Andry et al. with the lower order hybrid junction connected to a higher order junction disclosed by Roederer. Such a modification would have realized the advantageous benefit of using a lower number of couplers where the total length of lossy lines is approximately four wavelengths, the amplifiers having no ripple with the beam using all uniformly loaded amplifiers and one feed from each group (Roderer: col. 9, lines 52-58); further where Acoraci (abstract) teaches the network modules in the N x N Butler matrix comprising M x M and P x P Butler matrices where M can be equal to or differ from P
thus suggesting the obviousness of the modification.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Munoz-Garcia et al. or Acoraci, Nishikawa et al., and Roederer as applied to claim 36 above and further in view of Koch (US Patent No. 5,032,803).

Munoz-Garcia et al. or Acoraci, Nishikawa et al. and Roederer teach the modular stripline signal processing network module, discussed in the reasons for rejection of claim 35 above, where Munoz-Garcia et al. and Acoraci show a generic orientated modules (Figs. 4 and 5 by Munoz-Garcia et al. or Figs. 1 and 11 by Acoraci) and where Nishikawa et al. shows a planar oriented hybrid stripline coupler but are silent with respect to specific connections between coupler modules and the circuit board such as being edge connected to another network board.

Koch (Fig. 4) shows a similar multi-layer stripline coupler comprising a specific well-known art-recognized equivalent vertically orientated coupler module which is edge connected to another board.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the generic stripline coupler module connection disclosed by Munoz-Garcia et al. or Acoraci and Nishikawa et al. with the specific well-known art-recognized equivalent edge connected stripline coupler module connection disclosed by Koch. Such a substitution would have been a mere implementation of a specific well-known art-recognized equivalent connections of couplers to a circuit board; further where Koch teaches the coupler being able to be connected to a mother-board with relatively little space (col. 2, lines 10-14) thus suggesting the obviousness of the modification.

Allowable Subject Matter

Claims 11 – 13, 18 – 20, 26, 27, 30 and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Miller – shows and antenna system comprising hybrid couplers, beam forming, Butler matrix, and monopulse comparator.

Gerst – shows hybrid matrices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O Takaoka whose telephone number is (571) 272-1772. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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November 23, 2004